

## INFORMATION DISCLOSURE CITATION

Attorney Docket No.: GC647-2

Serial No.: 10/008,620

Applicant: Rodriguez et al.

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Filing Date: December 4, 2001

Group: 1627

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Date of this Submission: April 4, 2003

## US PATENT DOCUMENTS

| Examiner's | Document   |          |               |       | Sub-  | Filing |
|------------|------------|----------|---------------|-------|-------|--------|
| Initial    | Number     | Date     | Name          | Class | Class | Date   |
| JK         | *5,093,257 | 03/03/92 | Gray          |       |       |        |
| ✓          | *5,270,170 | 12/14/93 | Schatz et al. |       |       |        |
| ✓          | *5,521,077 | 05/28/96 | Khosla et al. |       |       |        |
| ✓          | *5,830,696 | 11/03/98 | Short         |       |       |        |

## FOREIGN PATENT DOCUMENTS

| Examiner's | Document         |          |         |       | Sub-  | Translation |
|------------|------------------|----------|---------|-------|-------|-------------|
| Initials   | Number           | Date     | Country | Class | Class | Yes/No      |
| JK         | *WO 87/01374     | 03/12/87 | PCT     |       |       |             |
| ✓          | *EP 0 563 103 B1 | 12/17/91 | EP      |       |       |             |
| ✓          | *WO 97/15657     | 05/01/97 | PCT     |       |       |             |
| ✓          | *WO 97/07205     | 02/27/97 | PCT     |       |       |             |
| ✓          | *WO 97/46670     | 12/11/97 | PCT     |       |       |             |
| ✓          | *WO 98/05765     | 02/12/98 | PCT     |       |       |             |
| ✓          | *WO 98/10102     | 03/12/98 | PCT     |       |       |             |
| ✓          | *WO 98/17684     | 04/30/98 | PCT     |       |       |             |
| ✓          | *WO 98/28416     | 07/02/98 | PCT     |       |       |             |
| ✓          | *WO 98/41623     | 09/24/98 | PCT     |       |       |             |
| ✓          | *WO 98/41653     | 09/24/98 | PCT     |       |       |             |
| ✓          | *WO 98/41622     | 09/24/98 | PCT     |       |       |             |
| ✓          | *WO 98/51802     | 11/19/98 | PCT     |       |       |             |

## OTHER DOCUMENTS

|            |  |
|------------|--|
| Examiner's |  |
| Initials   | Author, Title, Date, Pertinent Pages, etc.   |
| JK         | *Aslanidis et al., "Ligation-independent cloning of PCR products (LIC-PCR), <i>Nucleic Acids Research</i> , V. 18, No. 20 pp.6069-6074 (1990)  |
| ✓          | *Bashkirov, V., et al., "Interplasmidic illegitimate recombination in <i>Bacillus subtilis</i> ," <i>Mol Gen Genet</i> , V.1, 213 pp.465-470 (1988)  |
| ✓          | *Beck et al., "Introduction of arbitrary sequences into genes by use of class IIs restriction enzymes," <i>Nucleic Acids Research</i> , V. 22, N. 5, pp. 886-887 (1994)                              |
| ✓          | *Berger, S. et al, "Phoenix Mutagenesis: One-Step Reassembly of Multiply Cleaved Plasmids with Mixtures of Mutant and Wild-Type Fragments," <i>Analytical Biochemistry</i> , 214, pp. 571-579 (1993) |
| ✓          | *Bron, S. et al, "Ultraviolet Inactivation and Excision-Repair in <i>Bacillus Subtilis</i> ," <i>Mutation Research</i> , 15 pp.1-10 (1972)   |

Examiner

Date Considered

8/28/03

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|                               |  |
|-------------------------------|--|
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TECH CENTER 1600/2900

## OTHER DOCUMENTS

| Examiner's |  |
|------------|--|
| Initials   | Author, Title, Date, Pertinent Pages, etc.   |
| JE         | *Canosi, U. et al, "Plasmid Transformation in <i>Bacillus Subtilis</i> : Effects of Insertion of <i>Bacillus Subtilis</i> DNA into Plasmid pC194," <i>Mol Gen Genet</i> , 181, pp. 434-440 (1981)  |
|            | *Cheng, S. et al, "Effective amplification of long targets from cloned inserts and human genomic DNA," <i>Proc. Natl. Acad. Sci. USA</i> , V.91, pp.5695-5699 (1994)   |
|            | *Contente, S. et al, "Marker Rescue Transformation by Linear Plasmid DNA in <i>Bacillus Subtilis</i> ," <i>Plasmid</i> , 2, pp.555-571 (1979)  |
|            | *Crameri, A. et al, "DNA shuffling of a family of genes from diverse species accelerates directed evolution," <i>Nature</i> , V.391 pp.288-291 (1998)  |
|            | *Crameri et al., "Combinatorial Multiple Cassette Mutagenesis Creates All the Permutations of Mutant and Wild-Type Sequences," <i>Benchmarks</i> , V. 18, No. 2 , pp. 194-196 (1995)   |
|            | *Dustin, M. et al, "A novel Mutagenesis Strategy Identifies Distantly Spaced Amino Acid Sequences that are Required for the Phosphorylation of Both the Oligosaccharides of Procathepsin D by N-Acetylglucosamine 1-Phosphotransferase," <i>The Journal of Biological Chemistry</i> , V.270, No.1, pp.170-179 (1995) |
|            | *Guerout-Fleury, A. et al, "Plasmids for ectopic integration in <i>Bacillus subtilis</i> ," <i>Gene</i> , 180, pp.57-61 (1996)   |
|            | *Hall, Berry G., "Changes in the substrate specificities of an Enzyme during Directed Evolution of New Functions," <i>Biochemistry</i> , 20, pp.4042-4049 (1981)   |
|            | *Horton, R. M. et al, "Engineering hybrid genes without the use of restriction enzymes: gene splicing by overlap extension," <i>Gene</i> , 77, pp.61-68 (1989)   |
|            | *Iglesias, A. et al, "Plasmid Transformation in <i>Bacillus subtilis</i> : Symmetry of gene conversion in Transformation with a Hybrid Plasmid Containing Chromosomal DNA," <i>Mol Gen Genet</i> , 189, pp. 73-76 (1983)   |
|            | *Jansen, R. et al, "Disruption of phase during PCR amplification and cloning of heterozygous target sequences," <i>Nucleic Acids Research</i> , V.18, No. 17 pp.5153-5156 (1990)   |
|            | *Judo, M. et al, "Stimulation and suppression of PCR-mediated recombination," <i>Nucleic Acids Research</i> , Vol.26, No. 7, pp.1819-1825 (1998)   |
|            | *Kuijper et al., "Functional cloning vectors for use in directional cDNA cloning using cohesive ends produced with T4 DNA polymerase," <i>GENE</i> , issue 06325, PP. 147-155 (1992)   |
|            | *Lebedenko, et al., "Method of artificial DNA splicing by directed ligation (SDL)," <i>Nucleic Acids Research</i> , V. 19, N. 24, pp. 6757-6761 (1991)   |
|            | *Ling et al., "Approaches to DNA Mutagenesis An Overview," <i>Analytical Biochemistry</i> , V. 254,157-178 (1997) Article No AB972428  |
|            | *Kuchner, O. et al, "Directed evolution of enzyme catalysts," <i>TIB Tech</i> , Vol.15, 9 pages (1997)   |
|            | *Markland et al., "Iterative Optimization of High-Affinity Protease Inhibitors Using Phage Display. 1 Plasmin," <i>Biochemistry</i> , V. 35, pp. 8045-8057 (1996)  |
|            | *Marton, A. et al, "DNA nicking favors PCR recombination," <i>Nucleic Acids Research</i> , Vol.19, No.9, pp.2423-2426 (1991)   |
|            | *Merino et al., "A General, PCR-Based Method for Single or Combinatorial Oligonucleotide-Directed Mutagenesis on pUC/M13 Vectors," <i>BioFeedback</i> , V. 12, No. 4 , pp. 508-510, (1992)   |
|            | *Meyerhans, A. et al, "DNA recombination during PCR," <i>Nucleic Acids Research</i> , Vol.18, No. 7, pp.1687-1691 (1990)   |
|            | *Michel, B. et al, "Intramolecular recombination during plasmid transformation of <i>Bacillus subtilis</i> competent cells," <i>The EMBO Journal</i> , Vol.1, No.12, pp.1565-1571 (1982)   |
|            | *Michel, B. et al, "Intermolecular recombination during Transformation of <i>Bacillus subtilis</i> Competent Cells by Monomeric and Dimeric Plasmids," <i>Plasmid</i> ,10, pp.1-10 (1983)  |
|            | *Ness, J. et al, "DNA shuffling of subgenomic sequences of subtilisin," <i>Nature Biotechnology</i> , Vol.17, pp.893-896 (1999)  |
|            | *Niaudet, B. et al, "Insertional mutagenesis in <i>Bacillus subtilis</i> : mechanism and use in gene cloning," <i>Gene</i> , 19, pp.277-284 (1982)   |

|              |               |
|--------------|---------------|
| Examiner     |               |
| <i>Jan G</i> | <i>8/8/03</i> |

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Date of this Submission: April 4, 2003

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## OTHER DOCUMENTS

| Examiner's |   |
|------------|---|
| Initials   | Author, Title, Date, Pertinent Pages, etc.  |
| JE         | *Noirot, M.-A. et al, "Plasmid Replication Stimulates DNA Recombination in <i>Bacillus subtilis</i> ," <i>J. Mol. Biol.</i> , 196, pp.39-48 (1987)  |
|            | *Odelberg, S. et al, "Template-switching during DNA synthesis by <i>Thermus aquaticus</i> DNA polymerase 1," <i>Nucleic Acids Research</i> , Vol.23, No.11, pp.2049-2057 (1995)   |
|            | *Osuna et al., "Combinatorial mutagenesis of three major groove-contacting residues of EcoRI: single and double amino acid replacements retaining methyltransferase-sensitive activities," <i>GENE</i> , v. 106 pp. 7-12 (1991) |
|            | *Paabo, S. et al, "DNA Damage Promotes Jumping between Templates during Enzymatic Amplification," <i>The Journal of Biological Chemistry</i> , Vol.265, No.8, pp.4718-4727 (1990)   |
| N          | *Padgett et al., "Creating seamless junctions independent of restriction sites in PCR cloning," <i>GENE</i> , v. 168 PP. 31-35, (1996)  |
|            | *Peck, Joel R., "A Ruby in the Rubbish: Beneficial Mutations, Deleterious Mutations and the Evolution of Sex," <i>Genetics</i> , 137, pp.597-606 (1994)   |
|            | *QuikChange™ Site-Directed-Mutagenesis Kit; Stratagene  |
| JE         | *Rudolph, C. et al, "Transformation of <i>Bacillus subtilis</i> by Single-Stranded Plasmid DNA," <i>Journal of Bacteriology</i> , Vol.165, No.3, pp.1015-1018 (1986)  |
|            | *Schulga, A. et al, "An approach to construction of Hybrid Polypeptide molecules-homologue recombination method," <i>Nucleic Acids Research</i> , Vol.22, No.18, pp.3808-3810 (1994)  |
|            | *Shao, Z. et al, "Random-priming in vitro recombination: an effective tool for directed evolution," <i>Nucleic Acids Research</i> , Vol.26, No.2, pp.681-683 (1998)   |
|            | *Shi, X.-B. et al, "Rapid PCR Construction of a Gene Containing Lym-1 Antibody Variable Regions," <i>PCR Methods and Applications</i> , pp.46-53 (1993)   |
|            | *Stemmer, William P.C., "DNA shuffling by random fragmentation and reassembly: in vitro recombination for molecular evolution," <i>Proc. Natl. Acad. Sci. USA</i> , Vol.91, pp.10747-10751 (1994)                               |
|            | *Stemmer, William P.C., "Searching Sequence Space: Using recombination to search more efficiently and thoroughly instead of making bigger combinatorial libraries," <i>Bio/Technology</i> , Vol.13, pp.549-553 (1995)           |
|            | *Stoker, "Cloning of PCR products after defined cohesive termini are created with T4 DNA polymerase," <i>Nucleic Acids Research</i> , V. 18, No. 14, pp. 4290, (1990)   |
|            | *Szybalski et al., "Class-IIIS restriction enzymes - a review," <i>GENE</i> , v. 100, PP. 13-26 (1991)  |
|            | *Tawfik, D. et al, "Man-made cell-like compartments for molecular evolution," <i>Nature Biotechnology</i> , vol.16, pp.652-656 (1998)   |
| DR         | *Tseng, "DNA Cloning without Restriction Enzyme and Ligase, <i>Research Report</i> , V. 27 No. 6 pp. 1240-1244, (1999)  |
|            | *Tu et al., "Generation of a Combination of Mutations by Use of Multiple-Mutagenic Oligonucleotides," <i>Benchmarks</i> , V.20, N.3, pp.352-359   |
| JE         | *Wu et al., "Humanization of a Murine Monoclonal Antibody by Simultaneous Optimization of Framework and CDR Residues, <i>J. Mol. Biol.</i> , V. 294, pp. 151-162, (1999)  |
|            | *Young, Michael, "The Mechanism of Insertion of a Segment of Heterologous DNA into the Chromosome of <i>Bacillus subtilis</i> ," <i>Journal of General Microbiology</i> , 129, pp.1497-1512 (1983)                              |
|            | *Zhang, J.-H. et al, "Directed evolution of a fucosidase from a galatosidase by DNA shuffling and screening," <i>Proc. Natl. Acad. Sci. USA</i> , Vol.94, pp.4504-4509 (1997)   |
|            | *Zhao, H. et al, "Optimization of DNA shuffling for high fidelity recombination," <i>Nucleic Acids Research</i> , Vol.25, No.6, pp.1307-1308 (1997)   |
|            | *Zhao, H. et al, "Molecular evolution by Staggered extension process (StEP) in vitro recombination," <i>Nature Biotechnology</i> , Vol.16, pp.258-261 (1998)  |
| N          | *Zoller, "New Recombinant DNA methodology for protein engineering," <i>Current Biology Ltd.</i> , 3:348-354 (1992)  |

Examiner

Date Considered

8/28/03

Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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|                               |   |
|-------------------------------|---|
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## US PATENT DOCUMENTS

| Examiner's | Document     |          |              |       | Sub-  | Filing  |
|------------|--------------|----------|--------------|-------|-------|---------|
| Initial    | Number       | Date     | Name         | Class | Class | Date    |
| JE         | 5,512,463 A  | 4/30/96  | Stemmer      | 435   | 012   | 6/4/94  |
|            | 5,789,166    | 8/4/98   | Bauer et al. | 435   | 6     | 12/8/95 |
|            | 5,932,419    | 8/3/99   | Bauer et al. | 435   | 6     | 4/17/97 |
|            | 6,251,604 B1 | 6/26/01  | Lietz        | 435   | 6     | 8/13/99 |
|            | 6,319,694 B1 | 11/20/01 | Lietz        | 435   | 912   | 3/3/00  |

## FOREIGN PATENT DOCUMENTS

| Examiner's | Document    |         |         |       | Sub-  | Translation |
|------------|-------------|---------|---------|-------|-------|-------------|
| Initials   | Number      | Date    | Country | Class | Class | Yes/No      |
| JE         | WO 93/12257 | 6/24/93 | PCT     |       |       |             |

## OTHER DOCUMENTS

|  |  |                 |                |
|--|--|-----------------|----------------|
| Examiner's   |  |                 |                |
| Initials   | Author, Title, Date, Pertinent Pages, etc.   |                 |                |
| JE   | Chen et al., "Amplification of closed circular DNA in vitro," Nucleic Acids Research, vol. 26, no. 4, pp. 1126-1127, 1998. |                 |                |
|  | Copy of PCT Search Report  |                 |                |
|  |  |                 |                |
|  |  |                 |                |
|  |  |                 |                |
|  |  |                 |                |
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